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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/520,934

10/13/2005

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EXAMINER

KERNS, KEVIN P

ART UNIT

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1793

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/520,934	Applicant(s) ODASHIMA ET AL.	
	Examiner Kevin P. Kerns	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 August 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 1-6 and 14-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7-11 is/are rejected.
- 7) ☒ Claim(s) 12 and 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/12/05; 3/20/06; 8/19/08</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicants' election without traverse of Group II (claims 7-13) in the reply filed on August 4, 2008 is acknowledged.

Specification

2. The abstract of the disclosure is objected to because reference numbers "101", "104", and "103" should be either enclosed in parentheses or deleted for clarity. Correction is required. See MPEP § 608.01(b).

3. The use of the trademarks "Lumiboard", "Insural", and "Fiber Blanket Board" have been noted in this application (on page 22 of specification). They should be capitalized wherever they appear and be accompanied by the generic terminology. Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

Claim Objections

4. Claims 12 and 13 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims have not been further treated on the merits.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. (US 4,653,571) in view of JP 6-158210.

Regarding independent claim 7, Suzuki et al. disclose a method for horizontal continuous casting of aluminum and aluminum alloys (column 1, lines 10-13; column 2, lines 30-61; column 3, lines 51-57; column 4, lines 36-65; column 5, lines 1-15; column 6, lines 59-64; Examples 1-4; and Figures 1, 6, 8, and 10), in which the method includes the steps of casting molten aluminum/aluminum alloy 9 from an outlet 11 of a tundish 10

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(into rods, or cylindrical ingots – column 3, line 53) using a tubular chilled mold 1 that is supported to have its center axis extending horizontally and that is comprised of aluminum alloy (as set forth in claim 9 – see column 4, lines 40-45), providing a forced cooling water jacket 2 that ejects cooling water 18, such that a temperature difference is controlled between the molten aluminum/aluminum alloy (which is higher than a liquidus temperature set forth in claim 9) being teemed into the tubular mold 1 and a solidification temperature of the solidified ingot 14, thus resulting in an aluminum alloy rod (ingot 14) that includes silicon of 11.7 wt.% (included within the 7-14 mass% of Si of claim 9) in the embodiment of Example 4.

Regarding claim 8, a speed of removing the rod from the tubular mold is controlled, as casting speeds range from 150 to 600 mm/min (being directly proportional to the cooling water supply rates, while being inversely proportional to the cross-section/diameter of the mold, in the embodiments of Examples 1-4), thus being within the range of 200 to 1,500 mm/min of claim 9.

Although Suzuki et al. disclose 11.7 wt% silicon (Si-rich) in the aluminum alloy rod cast by horizontal continuous casting, Suzuki et al. do not disclose that the rod has a Si-rich portion having a thickness of at least 20 microns on a surface of a lateral side of the rod having a central angle of at least 30 degrees, as well as addition of high purity metallic (elemental) calcium of at least 0.003 mass% as a raw material added to the aluminum alloy.

However, JP 6-158210 (see abstract) discloses a hypereutectic Al-Si alloy having excellent workability and its method of manufacture, in which the method includes

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providing an alloy of 13-21 wt% Si, 6-120 ppm Ca (metallic/elemental calcium of >0.003 mass%, for which one of ordinary skill in the art would have added high purity Ca of <99.9% mass to obtain an improved aluminum alloy product with fewer impurities – as set forth in claims 10 and 11), with minor addition of P (elemental phosphorus) and balance aluminum/aluminum alloy, melting the hypereutectic alloy to obtain primary Si crystals, with the primary Si crystals having good workability, machinability, and wear resistance (abstract). One of ordinary skill in the art would have recognized that the portion (particles of primary crystals) of silicon in the Si-rich (13-21 wt%) aluminum alloy would be present within 20 microns of the surface and at a central angle of at least 30 degrees (as dispersed as Si primary crystals within the aluminum alloy), as horizontal continuous casting is subject to gravitational and unbalanced solidification (in reference to the paragraph that begins with “A first problem” on page 2 of applicants' specification) that would result in a metallographic structure that is not homogeneous. In addition, it would have been obvious to one of ordinary skill in the art at the time of the invention to choose the instantly claimed ranges through process optimization, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See In re Boesch, 205 USPQ 215 (CCPA 1980).

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify the method for horizontal continuous casting of Si-containing aluminum and aluminum alloys, as disclosed by Suzuki et al., by providing the Si-rich portion having a thickness of at least 20 microns on a surface of a

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lateral side of the rod having a central angle of at least 30 degrees, as well as addition of high purity metallic (elemental) calcium of at least 0.003 mass% as a raw material added to the aluminum alloy, as disclosed and/or suggested by JP 6-158210, in order to obtain primary Si crystals, with the primary Si crystals having good workability, machinability, and wear resistance (JP 6-158210; abstract).

8. Claims 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. (US 4,653,571) in view of JP 6-158210, and further in view of Kittilsen et al. (US 5,915,455).

Suzuki et al. (in view of JP 6-158210) disclose and/or suggest the features of claims 7 and 8 above, in addition to the features of claims 9-11 with the exception of the effective mold length of 15 to 70 mm in the horizontal continuous casting apparatus.

However, Kittilsen et al. disclose an apparatus for horizontal continuous casting (Figure 2), in which the apparatus includes a mold having a mold depth (length) of 25-45 mm (abstract; column 2, lines 10-11; and column 3, lines 50-59; and Table 1), such that these mold dimensions are advantageous for producing ingots that are acquired at adequate casting speed and good surface quality (column 2, lines 10-11; and column 3, lines 50-52). In addition, it would have been obvious to one of ordinary skill in the art at the time of the invention to choose the instantly claimed ranges through process optimization, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See In re Boesch, 205 USPQ 215 (CCPA 1980).

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify the combined teachings of Suzuki et al. in view of JP 6-158210, by using the effective mold length of 15 to 70 mm in the horizontal continuous casting apparatus, as taught by Kittilsen et al., in order to produce ingots that are acquired at adequate casting speed and good surface quality (Kittilsen et al.; column 2, lines 10-11; and column 3, lines 50-52).

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references were cited in the IDS of January 12, 2005 (but without copies of these foreign references), and these four references have been considered and are cited in the PTO-892 (with copies also provided in this Office Action): JP 2001-20047, JP 2000-54047, JP 6-158210, and JP 2-63647. US 4,077,810 and JP 62-81249 are also cited in PTO-892 as related to the applicants' invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin P. Kerns whose telephone number is (571)272-1178. The examiner can normally be reached on Monday-Friday from 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on (571) 272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kevin P. Kerns
Primary Examiner
Art Unit 1793

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Primary Examiner, Art Unit 1793
November 16, 2008